

**EAST KENTUCKY
POWER COOPERATIVE**

(Kentucky 59 Fayette)

**ENVIRONMENTAL REPORT
FOR THE PROPOSED
GM TO MEMPHIS JUNCTION
ELECTRIC TRANSMISSION LINE**

June 2006

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1.0 INTRODUCTION

East Kentucky Power Cooperative (EKPC) of Winchester, Kentucky is a non-profit electric generation and transmission cooperative headquartered in Winchester, Kentucky that provides electric power to 16 locally based electric distribution cooperatives. The distribution cooperatives distribute power to over 489,000 electric consumers in 89 counties located across the central and eastern portions of Kentucky. EKPC has requested financing from the Rural Utility Service, an agency that administers the U.S. Department of Agriculture's Rural Development programs (USDA Rural Development), to construct and maintain a 161 kilovolt (kV) electric transmission line in central Warren County, Kentucky. The USDA Rural Development must complete an environmental analysis and prepare an Environmental Assessment (EA) in accordance with its *Environmental Policy and Procedures for Implementing the National Environmental Policy Act* (7 CFR Part 1794), prior to approving the financing assistance for the proposed project.

GILPIN GROUP - Environmental Consulting & Planning of Wellsville, New York has been contracted by EKPC to conduct an environmental investigation and analysis, and prepare a report that can be adopted by the USDA Rural Development as an EA to meet their environmental regulations for complying with the *National Environmental Policy Act of 1969* (NEPA). The EA will serve as a detailed written record of the environmental analysis completed for the proposed project and will be used to determine whether preparation of an Environmental Impact Statement is necessary. The EA incorporates a detailed description of the proposed project, and copies of portions of topographic maps locating the project, along with a discussion of the need and alternatives considered for the proposed action. A discussion of the affected environment within the proposed project areas, the environmental

impact of the proposed action, and the mitigation of potential environmental impacts is also included.

2.0 PROPOSED ACTION & FEDERAL DECISION TO BE MADE

EKPC has requested financing assistance from USDA Rural Development for the proposed construction of an electric transmission line in central Warren County, Kentucky. The proposed federal action related to EKPC's proposed electric project would be USDA Rural Development's granting of financing assistance for the construction of the proposed facilities. The USDA Rural Development's decision to be made based on the environmental analysis outlined in the EA would be whether to implement the proposed action and grant the financing assistance for the construction of the proposed transmission line.

3.0 PROJECT DESCRIPTION

The proposed GM to Memphis Junction Electric Transmission Line would be designed for 161 kilovolt (kV) operation and would be 15.21 miles in length. The new transmission line would be supported by approximately 195 single, and H-frame double and triple, Corten tubular steel pole structures (See TRANSMISSION SUPPORT STRUCTURE DIAGRAMS, Appendix B) that would range in height from 95 to 100 feet aboveground. The average span between support structures would be 600 feet. The majority of the proposed new transmission line would be constructed to double circuit specifications with crosses arms installed on both sides of the support poles (See TRANSMISSION SUPPORT STRUCTURE DIAGRAMS, Double Circuit Tangent Structure, Appendix B) but would be operated as a single circuit line with electrical conductors only strung on one side until the electric load in

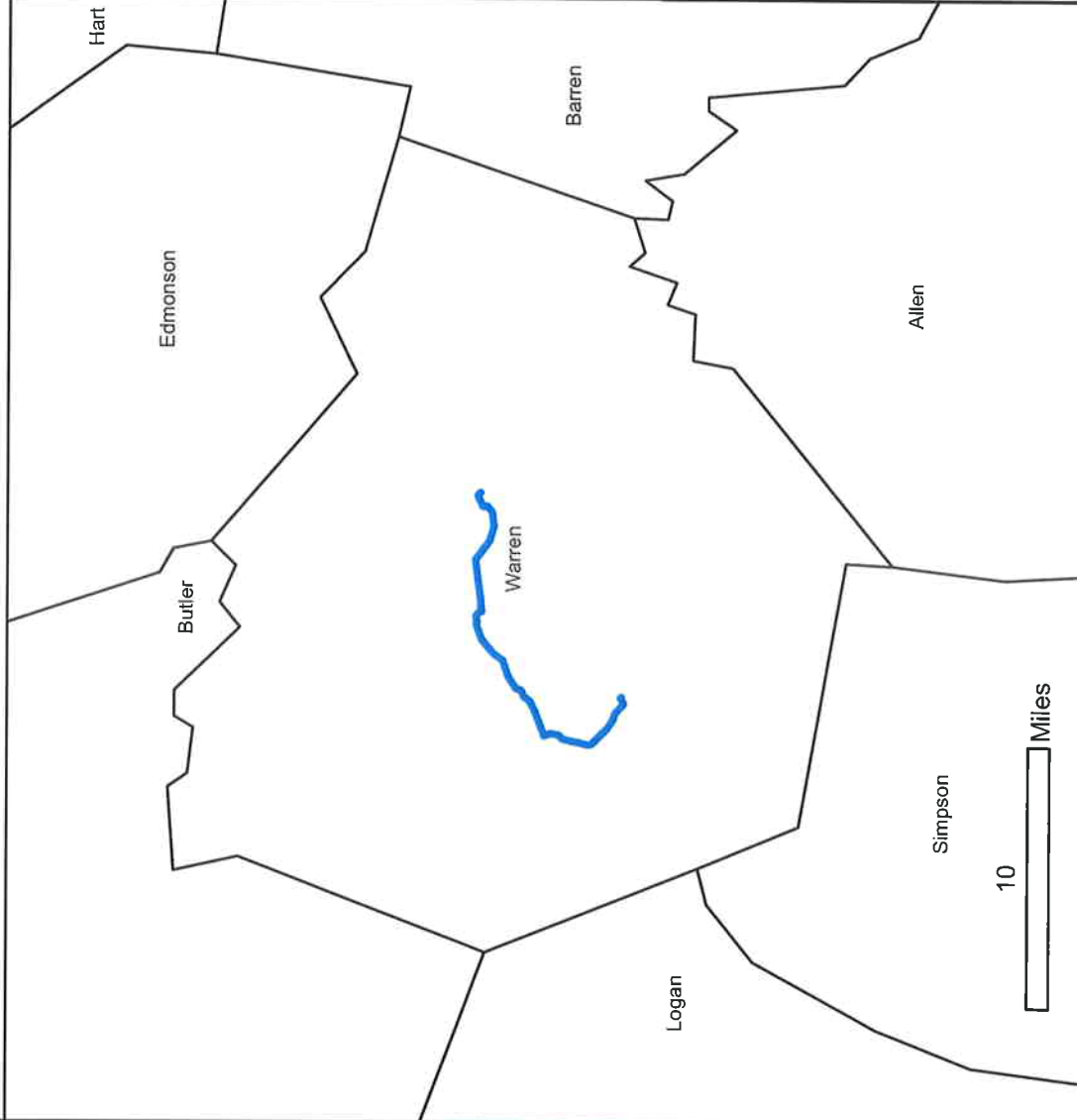
the area warrants operation of a second circuit. However, roughly one quarter of the proposed line would be constructed as single circuit with cross arms and conductors only installed on one side of the support structures (See TRANSMISSION SUPPORT STRUCTURE DIAGRAMS, Appendix B).

Construction of the new line would involve rebuilding a 5.17 mile section of existing double circuit 69 kV transmission line and a 3.39 mile section of existing single circuit 69 kV transmission line, both supported by single wood pole structures on existing 100 foot wide ROWs. The existing lines within these two sections would be dismantled and replaced by the proposed new transmission line. The proposed new line would be located on the existing 100 foot wide ROWs within these two sections and would not require any additional ROW width. The balance of the proposed new line would be new construction, 2.41 miles of which would require a new 100 foot wide ROW and would parallel an existing electric transmission line, and 4.24 miles of which would require a new 100 foot wide ROW, 50 feet of which would be shared with another proposed new electric transmission line. The ROW for the proposed transmission line would encompass approximately 184.4 acres of land, of which 118.4 acres would utilize existing ROWs. The total estimated cost of constructing the proposed new transmission line would be \$5,900,000.

3.1 PROJECT LOCATION

The proposed project area is located in central Warren County, Kentucky (See *Project Area Location Map*, page 4). The proposed route for the new electric transmission line extends westerly following an existing electric utility line ROW from an existing substation at an automotive assembly plant located east of Bowling Green, Kentucky, to an existing electric generating station located on the southern side of the Barren River in northern

PROJECT AREA LOCATION MAP



EAST KENTUCKY POWER COOPERATIVE
P.O. Box 707
Winchester, KY 40392-0707

GM - Memphis Jct
Proposed 161kV Transmission Line
Warren County, KY
Project No. 21392

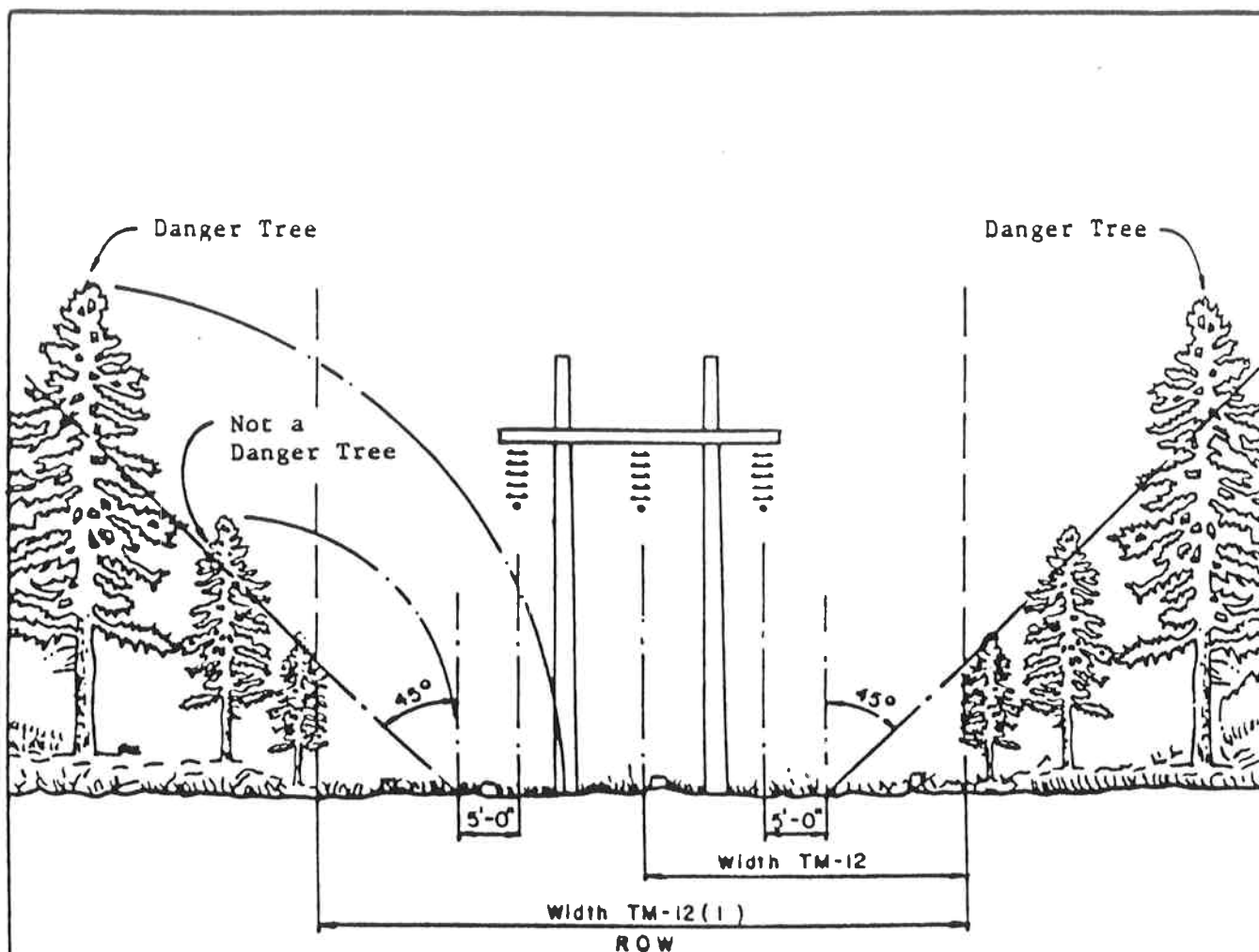
Proposed Transmission
Line Route

Bowling Green. The proposed route then extends in a general southwesterly direction paralleling an existing electric transmission line from the generating station and following an existing electric transmission line ROW to a point where the route extends due south to connect to an existing electric substation southwest of Memphis Junction, Kentucky (See PROJECT REFERENCE MAPS, Appendix A).

3.2 CONSTRUCTION & MAINTENANCE PROCEDURES

3.2.1 Construction

The construction of the proposed electric transmission line is tentatively scheduled to begin in the fall and winter of 2006-07 and the estimated duration of construction would be 10 months. EKPC has determined that clearing would be required on approximately 17 percent of the proposed route for the new electric line. During the clearing of the proposed route, brush, trees and old stumps within the designated ROW would be cut to a maximum height of four inches aboveground using chainsaws, bulldozers and/or excavators. Merchantable trees cut from the proposed ROW may be cut into commercial lengths and piled along the ROW for the landowner to utilize or sell. Trees may also be disposed of, left where they fall, windrowed, chipped or scattered depending on the requests of the landowners. Dead or living trees outside the transmission line ROW that could fall within five feet of a point underneath the outside conductor (hazard tree) would be cut to protect the line from electrical outages caused by falling trees and branches during high wind and storm events (See *Right-Of-Way Clearing Guide*, page 6). Individual trees located within sections of the proposed ROW that are not cleared may also be cut if they threaten to come into contact with the electrical conductors. The holes for the transmission line support structures would be mechanically dug and the poles placed using a digger/derrick truck. Minimal



NOTES:

1. Engineer will designate all danger trees which shall be removed or topped at option of contractor. In approximately level terrain, trees which would reach within 5 feet of a point underneath the outside conductor in falling are examples of danger trees.
2. As directed by the engineer, portions of the right-of-way (ROW) must be cut so that stumps will not prevent the passage of tractor and trucks along the ROW.
3. The unit for clearing one-half of the ROW is "WIDTH TM-12."
4. The unit for clearing the full ROW is "WIDTH TM-12(1)."
5. The unit for clearing danger trees is "TM-13."

TRANSMISSION ROW CLEARING
RIGHT-OF-WAY CLEARING GUIDE

blasting may be necessary in areas where the truck cannot dig through rock that could be present; however, blasting would only be used as a last resort. The diameter of the augered holes would be three to four feet in width and the depth of the holes would be 14 to 23 feet depending on the height of the poles. The holes around the poles would be backfilled with a dense grade material, such as gravel. Concrete would not be used to fill the holes. The dirt taken from the hole would be disposed of or spread around the structure. The electrical conductor would be strung using a pulley system along with a truck mounted conductor spool and tensioner, or a helicopter. Appropriate soil erosion and sedimentation control procedures, such as seeding and mulching, and/or the utilization of berms, staked straw bales and silt fences, would be implemented during and after the construction of the proposed transmission line in areas denuded of vegetation.

Access to and from the transmission line ROW during construction and maintenance procedures would be from public and private roads in the project area. Prior to the use of any private roads, permission would be obtained from the property owner either by EKPC or its agent. Construction of access roads to reach transmission support structure locations would be limited to the proposed ROW and off-road travel along the proposed transmission line route would be limited to the ROW, to the maximum extent practicable. The access roads would be 12 feet in width and would be constructed with the assistance of heavy equipment, such as a bulldozer or skidder. Erosion would be controlled along the new access roads by applying seed, lime, fertilizer and mulch to exposed soil areas. Water bars and dips would also be installed in the roads along with silt fences and staked straw bales to aid in preventing erosion. Gravel or crushed stone would be applied to road surfaces, as needed, to prevent rutting. Once construction of the proposed transmission line is completed, the new access

roads would either be left open, or closed to the public by means of earthen berms or keyed gates placed at the entrance of the roads, according to the direction of the landowners involved.

3.2.2 Maintenance

Once constructed, the proposed transmission line would be aerially inspected three times a year and would be ground inspected once every four years by walking the ROW. The minimum electrical clearances maintained from the transmission line conductors to the ground underneath the conductors would be 25 feet. As previously described, during the establishment of the proposed ROW all brush and woody-stemmed vegetation would be cut to a maximum height of four inches aboveground. Upon completion of the ROW clearing and construction activities, the vegetation within the ROW would be permitted to grow for one to two years and subsequently treated with a herbicide approved for such use by the U.S. Environmental Protection Agency. The herbicides would be applied according to label directions by licensed applicators. This initial herbicide treatment would be performed using a foliar application method during the months of May through October. The foliar method of application utilizes herbicide spray that is applied directly onto the leaves of non-desirable vegetation during the growing season when the plants are in full leaf.

Following the initial herbicide treatment, the woody-stemmed vegetation occurring within the ROW would be treated with an approved herbicide every three to four years, depending on the rate of vegetation growth. Vegetation may also be cut in order to bring it back to the size where it can be effectively treated with herbicides should an area be missed during the maintenance cycle or should excessive vegetation growth take place between the maintenance cycles. Dead or living trees outside the transmission line ROW that could fall

within five feet of a point underneath the outside conductor (hazard tree) would also be cut to protect the line from electrical outages caused by falling trees and branches during high wind and storm events.

4.0 PUBLIC INVOLVEMENT

Public involvement was integrated into the proposed project through a number of processes including newspaper notices, mailings, and two separate public meetings. The public meetings took the form of open houses that were held on March 15, 2005 at the L&N Depot, Bowling Green, Kentucky and May 10, 2005, Grace Baptist Church, Bowling Green, Kentucky. The purpose of the open houses was to give the members of the public living in the vicinity of the proposed project area the opportunity to learn about the proposed electric transmission project and to discuss their concerns regarding the proposed project with EKPC staff. The public was invited to the March 15th open house through notices placed in the *Bowling Green Daily News*, which were published on 3/2/05, 3/6/05, 3/9/05, and 3/13/05. The public was invited to the May 10th open house through notices placed in the *Bowling Green Daily News*, which were published on 5/1/05 and 5/8/05. The notices announced the proposed transmission project including a brief description and location of the project, as well as particulars regarding the open houses. EKPC also conducted a March 2, 2005 mailing to 126 addresses composed of property owners in the proposed project area, including public officials, inviting them to the March 15th open house, and an April 27, 2005 mailing to 160 addresses composed of property owners in the proposed project area, including public officials, inviting them to the May 10th open house. The March 15th open house was attended by 21 individuals, including public officials, representing 26 parcels of land. 41 individuals

representing 26 parcels of land attended the May 10th open house, and no public officials attended. The majority of the types of verbal comments received from the public during the open house involved concerns regarding the following issues:

- access to property by construction and maintenance contractors, and possible damage to fences, fields, etc.;
- electromagnetic fields in relation to the proposed transmission line;
- relocation of existing transmission line support structures when rebuilding the existing line, such as moving structures to fence lines, moving structures further away from barns and outbuildings, etc.

No written comments were received as a result of the open house.

In addition to the open houses, newspaper notices and mailings described above, EKPC placed newspaper advertisements in the February 27 & 28, 2006 edition of the *Bowling Green Daily News*, in accordance with 36 CFR Part 800 of the *National Historic Preservation Act*, as amended, soliciting consulting parties who have a demonstrable interest in important historic and archaeological resources in the project impact area. Three respondents replied as a result of the newspaper advertisement.

5.0 NEED FOR THE PROPOSED ACTION

Warren Rural Electric Cooperative Corporation (WRECC), located in Bowling Green, Kentucky, currently receives its electric power requirements from the Tennessee Valley Authority (TVA) and its contract with TVA will expire in early 2008. In 1997 TVA offered its distributors an exit from their power supply contracts upon a required five-year notice. WRECC studied their rate situation and identified a significant disparity between TVA's Kentucky Distributors and their counterparts served by other power suppliers in Kentucky. This situation prompted WRECC to examine their power supply options and, based on the

availability of economical generation services and a favorable environment relative to transmission access, WRECC gave the required five-year notice to TVA to end the power supply agreement effective April 1, 2008. WRECC issued a request for proposals to supply power and received a number of proposals, including one submitted by EKPC. Over a period of three years, WRECC researched and thoroughly evaluated the proposals on the basis of future cost, long-term security, reliability, and lasting value for their members. In early 2004 WRECC selected the EKPC proposal as the best and most cost effective plan to meet their future power supply needs, which included full membership in EKPC. By becoming a member of EKPC's system, WRECC would become a part owner of EKPC and, as such, would have a voice, and a vote, on decisions that would directly affect them in the future. Consequently, WRECC applied for membership with EKPC and was accepted as a member in May 2004 by EKPC's Board of Directors. As a result, in April 2008, when its contract with TVA expires, WRECC will join EKPC as one of EKPC's member electric distribution cooperatives and will begin having its electrical energy requirements fulfilled by EKPC.

WRECC currently is not connected to the EKPC power grid. EKPC initially investigated the possibility of connecting WRECC to its system by wheeling electric power from EKPC to WRECC through TVA's system. This means that TVA would transfer electric power through its system from EKPC to WRECC for a fee; however, TVA would not agree to provide such a service and has taken the position that it will not provide transmission wheeling to former TVA electric power distributors, such as WRECC. Therefore, EKPC determined that it must construct transmission lines that would tie WRECC into its system and transport electric power to WRECC's system. A study was subsequently conducted to determine the transmission facilities that would be needed to reliably provide electric service

to WRECC beginning in 2008. The design objective of this transmission study for service to WRECC was to develop an electric transmission system that would meet the following requirements:

- provide a direct connection from the EKPC system to WRECC's system, with sufficient capacity between the two systems to allow EKPC to contractually deliver the electric power to meet WRECC's need;
- connect all of WRECC's existing 161 kV delivery points (East Bowling Green/General Motors (GM), Memphis Junction, and Aberdeen);
- connect the new WRECC 161 kV delivery point at Magna to the existing 161 kV delivery points; and
- provide an adequate and reliable transmission system that does not result in system problems for either EKPC or neighboring electric transmission systems for normal and/or single-contingency conditions.

In past years, TVA offered for sale, and WRECC purchased portions of the local transmission delivery system at 69kV and 161kV. The WRECC system is configured for the delivery of wholesale power, and currently receives wholesale power from TVA, at three primary delivery points. These three delivery points are WRECC's existing East Bowling Green, Memphis Junction, and Aberdeen Substation. Voltage levels at these locations are transformed from 161kV to 69kV. Because transmission connections must be made between the EKPC system and the WRECC system to provide service, these existing critical delivery points are the most reasonable connection locations for the proposed plan. If they were not used by EKPC, new delivery points requiring the construction of new substations to step down voltage and new transmission paths would be required. Because the WRECC system infrastructure already exists, the end points of the line construction are essentially predetermined. To construct new delivery facilities, as compared to utilizing the existing ones, would be considerably more costly and would create unnecessary impact to the people and resources of the area.

There are 4 projects that EKPC proposes to construct to provide service to WRECC and which will be covered in four separate EAs. The work will involve rebuilding of existing lines, paralleling existing lines, and/or construction on entirely new rights-of-way. The preferred order for construction of the proposed transmission line projects is as follows:

- 1st - GM – Memphis Junction (GM)
- 2nd - Memphis Junction – Aberdeen (MJA)
- 3rd - Barren County – Oakland – Magna (BOM)
- 4th - Wilson – Aberdeen (WA)

EKPC believes it is prudent to construct the GM – Memphis Junction project (the proposed action) first for the following reasons:

- 1) Co-Location – EKPC’s proposed alternative for this project would involve rebuilding approximately 8.56 miles or 56.28% of the proposed project. EKPC also proposes to parallel an additional 2.41 miles (~ 15.84%) of line. Some of the rebuild sections for this project occur in heavily developed areas. Also, rebuilding existing facilities is typically more complicated to construct than construction of lines on new right-of-way for three primary reasons:
 - Teardown of existing facilities. The material that currently exists on site must be removed and properly disposed.
 - Existing residences and structures. Frequently there are houses/buildings/outbuildings that have been built adjacent to the existing easement since the initial construction of the line.
 - Threats to reliability are created when the existing facilities are taken out of service. The existing facilities are needed and when removed from service WRECC must rely on backfeeds and procedures that are normally used for contingencies (unexpected problems in the system fallen (tree, transformer failure, etc)). Because contingencies can still happened during the time of construction, the removal of the existing lines must be coordinated and their outage time minimized to avoid unacceptable levels of reliability.
- 2) Reliability – Construction of GM – Memphis Junction first provides the needed backfeeds (voltage source from a secondary system) into the East Bowling Green/GM and Memphis Junction Substations. Once constructed, this line will allow continued, uninterrupted service to the residents of Bowling Green and the surrounding communities while other projects are constructed.

- 3) Right-of-way acquisition – Far fewer new easements must be acquired for the section of the project that is being rebuilt. Typically the existing easement can be amended and restated to include the current project, and the process is less time consuming.

GM - Memphis Junction		
	<i>Length</i>	<i>Percent</i>
Rebuild	8.56	56.28%
Parallel/Co-locate	2.41	15.84%
New Construction	4.24	27.88%
<i>Total</i>	15.21	100.00%

6.0 ALTERNATIVES

A number of alternatives were investigated by EKPC for the proposed electric transmission line project including *no action*, electrical alternatives including wheeling electric power to WRECC through the TVA system, and alternate routes. Based upon all the alternatives that were investigated, EKPC determined that the transmission project, as proposed, offered the most viable option for providing electric power to WRECC.

Energy conservation was not considered by EKPC as an alternative to the proposed transmission project because energy conservation would not provide a tie between EKPC's and WRECC's systems, which EKPC could use to provide electric power to WRECC.

6.1 NO ACTION

Choosing the *no action* alternative would involve maintaining the status quo and not constructing the project, as proposed. Should the proposed electric transmission line not be constructed, EKPC would not be able to fulfill WRECC's request for electric service and provide electric power to WRECC's distribution system (See Section 5.0 *NEED FOR THE PROPOSED ACTION*). As a result, WRECC would not be able to secure lower cost wholesale power at a more competitive rate than from its current power supplier and would

not be able to pass this cost savings onto its electric consumers. This is a situation that would be unacceptable to EKPC and WRECC, the Boards of Directors of these two electric cooperatives, and WRECC's member electric consumers. Therefore, EKPC determined that the *no action* alternative was not a viable alternative to the proposed action.

6.2 ELECTRICAL ALTERNATIVES

EKPC investigated a number of electrical alternatives to the proposed project including:

69 kV Facilities

EKPC considered the extension at 69 kV from EKPC's western most substation, closest to WRECC's system. However, this alternative was determined not to be feasible because it was determined not to have enough capacity due to WRECC's electrical demand, which is estimated to be approximately 400 megawatts in 2008.

345 kV Facilities

EKPC also considered constructing 345 kV facilities to WRECC's system as an alternative to the proposed project. However, this alternative was eliminated as being an option because EKPC determined that constructing 345 kV facilities would cost approximately twice as much as the proposed project to construct. At least 23 miles of 345 kV transmission line construction would be required with this alternative to connect the northern portion of WRECC's system to the nearest 345 kV facilities. An additional 29 miles of 161 kV transmission line construction would then be needed between the northern and central portions of WRECC's system.

Other 161 kV Facilities

Another alternative to the proposed project considered by EKPC was the construction of a 161 kV transmission line from GM to Aberdeen with a 161 kV tap line to Memphis junction. However, the reliability of this system was determined to be unacceptable, since a single fault anywhere on this three terminal line would eliminate EKPC's 161 kV connection to Memphis Junction.

Wheeling of Electric Power

EKPC also investigated the possibility of wheeling of electric power from EKPC to WRECC through TVA's system. As part of this alternative TVA would have transferred electric power through its system from EKPC to WRECC for a fee, however, TVA would not agree to providing such a service and this alternative was eliminated from consideration.

Triple Circuit

For the proposed GM – Memphis Junction project a connection had to be made between the existing GM and Memphis Junction Substations for reasons of reliability and independence of the system. A triple circuit system between the Memphis Junction Substation and the rebuild portion of this project was considered for this project but was dismissed for two reasons: 1) Failure of a structure in a triple circuit system is unacceptable from a reliability standpoint for this section of line; and 2) the single circuit from GM – Memphis Junction can be operated independently.

The electrical alternatives that were investigated by EKPC are documented in detail in a report entitled *STUDY TO PROVIDE TRANSMISSION SERVICE TO WARREN RURAL ELECTRIC COOPERATIVE* that was prepared for EKPC by Commonwealth Associates, Inc.

This report can be referred to online for further information at the USDA Rural Development's website: <http://usda.gov/rus/water/ees/ea.htm>.

6.3 ALTERNATE ROUTES

Since the electrical objectives of the proposed project include the need for a direct transmission connection at key substations in the WRECC system, the physical alternatives were limited to the areas and distances between the East Bowling Green (GM) and Memphis Junction Substations (See Section 5.0 *NEED FOR THE PROPOSED ACTION*). An assessment was made to determine how siting should be accomplished. The first consideration made was to explore opportunities for the use of existing ROWs, or replacement (rebuild) of existing lines. EKPC screened existing facilities in the project area to determine if they were good candidates for co-location/rebuild. The criteria used were as follows:

- 1) the critical function of the line and whether it could be removed from service for the construction time needed;
- 2) the amount of development or encroachment near the existing ROW easement;
- 3) the congestion or density of development in the surrounding areas;
- 4) the physical condition of the existing electric line; and
- 5) the need or lack thereof for an expanded ROW easement.

Based on this first review, some of the line segments were immediately chosen for co-location/rebuild. The first selections for co-location/rebuild were through the Bowling Green community. Since it was determined that these sections could be rebuilt/co-located, it was reasonable to conclude that there was no need to develop additional alternate routes for these sections. The remainder of the project was included in a more analytical comparison and siting effort.

For GM – Memphis Junction, existing electric transmission lines were evaluated and determined to be available for rebuilding for approximately 8.56 miles of the proposed route.

This 8.56 miles of line rebuild would occur in two separate sections, a 3.39-mile section and 5.17-mile section (See PROJECT REFERENCE MAPS, Appendix A). Another 2.41-mile section of the proposed route parallels existing transmission lines between the sections of the route containing lines that would be rebuilt. Alternate routes, or alignments, were not investigated for the portion of the proposed route that extends to the north around Bowling Green in a general east-west orientation (See Maps 1 of 3 & 2 of 3, Appendix A) because this portion of the route follows existing electric transmission line ROWs by either being located within the existing ROWs (co-location/rebuild), or paralleling immediately adjacent to the existing ROWs.

The remainder of the proposed route would involve a proposed new line segment that would not entail co-location/rebuild or paralleling existing electric facilities, but would parallel another proposed route developed for EKPC by Photo Science using the EPRI Overhead Electric Transmission Line Siting Methodology. Factors such as the built environment (proposed and existing development), the natural environment, and engineering concerns were used to develop alternate routes. All routes were analyzed using the following issues in order to choose the least disruptive route available.

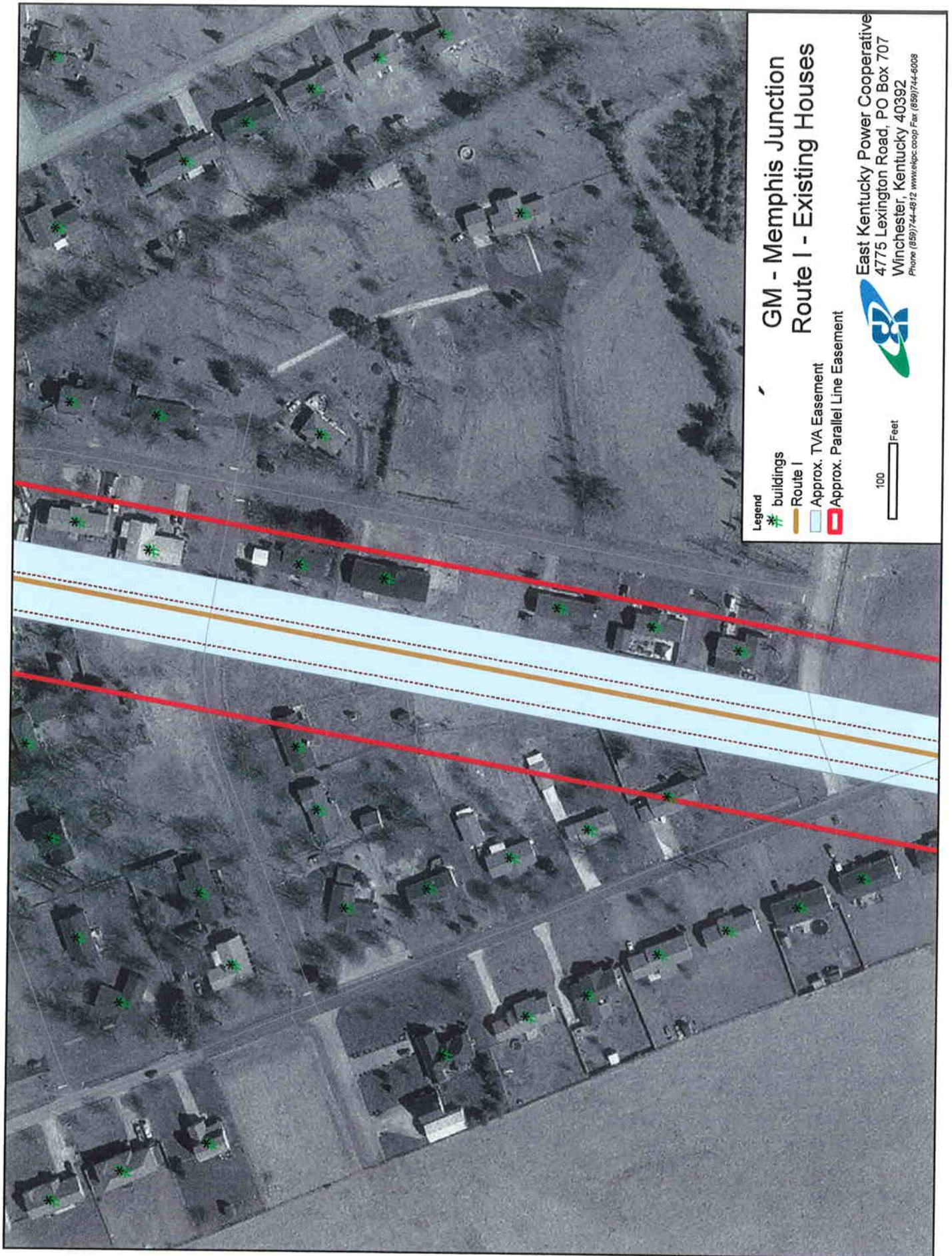
- Visual Issues
 - ✓ Number of people in the general public that would view the line on a daily basis.
- Community Issues
 - ✓ Number of people affected, directly or indirectly.
 - ✓ Proximity of residences to proposed line.
- Schedule/Delay Risk:
 - ✓ Number of parcels/property owners.
 - ✓ Number of new easements required.
- Proximity to existing roads.
 - ✓ Proximity to existing transmission corridors.

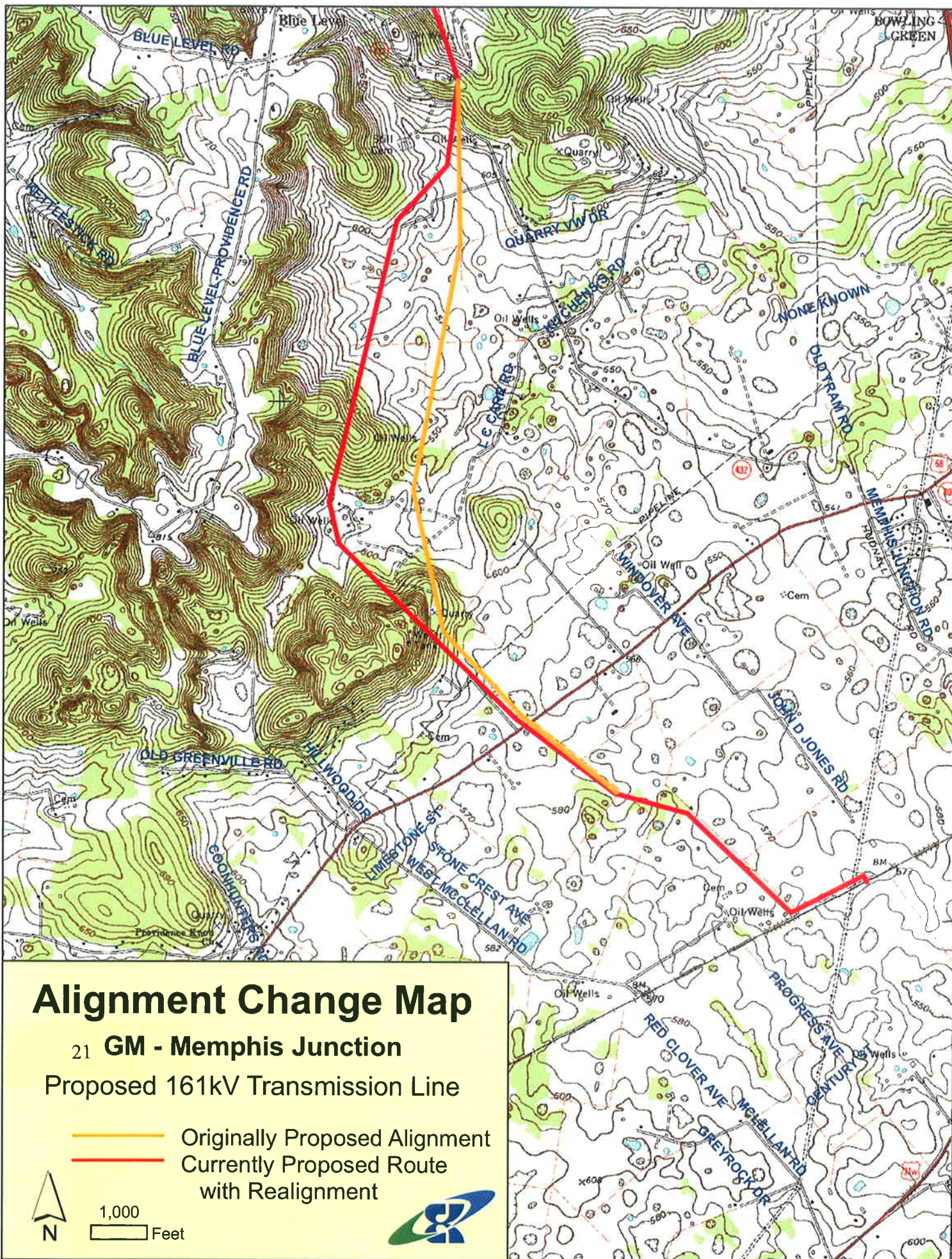
- Special Permit Issues
 - ✓ Number of physical constraints needing special permits to construct the line over. Such as, river crossings, major highway crossings, railroad crossings, public land crossings, etc...

A number of alternate routes were investigated for the proposed new line segment that does not follow existing electric utility line ROWs and extends in a north-south orientation in the southwestern portion of the proposed project area (See Map 3 of 3, Appendix A). All of these alternate routes were located slightly further to the east than the proposed route, closer to Bowling Green. The eastern most alternate route that was investigated scored low impacts on construction/maintenance accessibility issues, medium impacts on visual and schedule delay issues, and high impacts on community issues. This alternate route is located on TVA easements and it would have been necessary to locate the proposed new line off the existing easement (parallel) in a very congested area. If EKPC attempted to parallel the existing line on either side of this route, it would have required exiting residences to be removed (See Route I – Existing Houses Figure, page 20). Therefore, paralleling the existing TVA line was removed from consideration.

Two other alternate routes investigated were located a few thousand feet further east than the proposed route, and both cross U.S. Highway 68 at a location of proposed and ongoing development, which would increase the number of parcels of land affected. Both of these alternate route scored medium impacts on visual, community, schedule delay, and construction/maintenance accessibility issues; however, they were eliminated from consideration due their impact on the proposed and ongoing development.

Beside the alternate routes outlined above, the mid portion of the proposed route for the new line segment was realigned. This portion of the proposed route was originally located approximately 1,000 to 1,300 feet further to the east than the currently proposed





route; however, due to suggestions and negotiations with property owners in the area, the line was moved to its currently proposed location (See Alignment Change Map, page 21).

For a more detailed discussion of the alternate routes developed for the proposed electric transmission project refer to *The EPRI Overhead Electric Transmission Line Siting Methodology Results for East Kentucky Power Cooperative's Memphis Junction – Natcher Parkway Junction 161 kV Transmission Line, Barren – Oakland – Magna 161 kV Transmission Line, and Wilson – Aberdeen – Morgantown 161 kV Transmission Line Projects* in Appendix D of this document.

7.0 EXISTING ENVIRONMENT

The proposed project area lies in the Mississippian Plateaus region in south-central Kentucky, and is characterized by gently rolling hills, sinkholes and isolated knobs. The topography along the eastern and central portions of the proposed transmission line route is composed of very gently rolling hills, while the westernmost portion of the route extends through more steeply sloping hills and valleys.

The majority of the portion of the proposed route for the GM to Memphis Junction Transmission Line that extends in a general east-west orientation, east, north and west of the municipality of Bowling Green, Kentucky, is located within dedicated ROWs for existing electric utility line ROWs, with approximately one quarter of this portion of the route paralleling, immediately adjacent to, existing electric utility line ROWs. The eastern and northern portions of the proposed route extend through urban and urbanizing areas associated with Bowling Green, while the majority of the southern and western portions of the proposed route extend through agricultural land used mostly for row crops, such as corn and soybeans,

intermixed with rural residential development. The proposed transmission line route also traverses approximately 2.1 miles of forested areas consisting of small patches of woods on ridge tops or along the Barren River and its tributaries. The upland forested areas are typically composed of second and third-growth oak-hickory forests, and the riparian zones contain species commonly present in bottomland hardwood forests, such as sycamore (*Platanus accidentalis*), box elder (*Acer negundo*), hackberry (*Celtis occidentalis*), and silver maple (*Acer saccharinum*).

The proposed transmission line route crosses the Barren River three times, as well as Jennings Creek three times. The proposed route also crosses a few intermittent tributaries of Jennings Creek. The Barren River is recognized by the U.S. Army Corps of Engineers as being navigable in the proposed project area. However, none of the watercourses in the area are designated as being Outstanding Resource Waters, Cold Water Aquatic Habitats, National, or Wild and Scenic Rivers, or special water resources (exceptional waters).

Common wildlife species in the project area include white-tailed deer, wild turkey, gray squirrel, cardinals, Carolina wrens and robins. Threatened and endangered species that could potentially occur within the project impact area include the Indiana bat (*Myotis sodalis*), the gray bat (*Myotis grisescens*), Price's potato-bean (*Apios priceana*), and a number of species of mussels.

A review of the *National Wetland Inventory Maps (NWI Maps)* for the proposed project area revealed that the easternmost crossing of the Barren River by the proposed transmission line route is recognized as a riverine unconsolidated bottom wetland and the two crossings of the Barren River are recognized as lacustrine limnetic unconsolidated wetlands. The review of the *NWI Maps* also revealed that the Jennings Creek crossings are recognized

as riverine unconsolidated bottom wetlands and that the proposed route crosses two small isolated palustrine unconsolidated wetlands, one on the eastern end of the proposed route and one on the western end.

A review of *Flood Insurance Rate Maps* (Community Panel Numbers 21227C 0084 D, 21227C 0094 D, 21227C 0100 D, 21227C 0105 D, & 21227C 0160 D) revealed *Special Flood Hazard Areas* that are associated with the Barren River and Jennings Creek, and are inundated by a 100-year flood. The floodplains extend all along the river and creek through the project area, and the portion of the proposed route in which the proposed new line would parallel existing transmission line, north and northwest of Bowling Green, is located almost entirely within the floodplains of the Barren River and Jennings Creek. The proposed rebuild section on the eastern end of the proposed route also extends into the floodplain associated with the Barren River, and the eastern end of the western rebuild portion of the proposed route also extends into the floodplain of Jennings Creek.

The U.S. Natural Resource Conservation Service (NRCS) was contacted regarding the proposed electric transmission project pertaining to prime and statewide important farmland soils. Based on this contact the NRCS reviewed the *Soil Survey of Warren County, Kentucky* in connection with the proposed project area and responded that approximately 25 to 30 percent of the proposed new ROW that would not parallel an existing transmission line is composed of prime and important farmland soils, approximately 40 to 45 percent of the proposed new ROW that would parallel an existing transmission line is composed of prime and important farmland soils, and the proposed rebuild portions of the proposed project would not affect these types of soils.

The Kentucky Heritage Council, State Historic Preservation Office (SHPO) was contacted regarding important cultural (historic and archaeological) resources in relation to the proposed electric transmission project. The SHPO reviewed the proposed project in relation to the proposed project area and its files of known historic resources, and requested a cultural historic reconnaissance survey of the project area and a reevaluation of five previously identified sites in the area of potential effect. EKPC had the requested survey performed. Based on information supplied by the SHPO, along with the survey results, the survey report concluded there are no known historic properties or sites that are listed or proposed for listing in the *National Register of Historic Places* located in the project impact area. The survey report also concluded that there is one known historic site (aboveground resource) in the project area that appears to be eligible for listing, the Gladdish-Asher property located on the southern side of U.S. highway 68; and one industrial archaeological resource potentially eligible for listing comprised of a large quarry located on the Perkins property on the northern side of U.S. Highway 68 (See Cultural Resource Survey, Appendix D, for more detailed information).

No developed recreational facilities, such as campgrounds or recognized hiking trails, are located in the vicinity of the proposed route for the electric transmission line. However, incidental recreational activities, such as hiking and hunting, could take place within the project area.

Other Planned or Occurring Projects

There are several other past, present, and reasonably foreseeable actions occurring, or planned in the general project vicinity that may be relevant in the assessment of the potential cumulative effects of the proposed project, *i.e.*, the incremental effects of the proposed project

taking into account other past, present, and reasonably foreseeable actions in the area. As described in Section 5.0 *NEED FOR THE PROPOSED PROJECT*, those actions include three other transmission line projects proposed by EKPC as part of the overall transmission system improvements needed to connect the WRECC transmission and distribution system with the EKPC generation and transmission system. Those segments, each of which is an independent action that will be subject to preparation of an Environmental Assessment, include: 1) the Barren-Oakland-Magna project (approximately 28.4 miles in length); 2) the Memphis Junction-Aberdeen project (approximately 27.57 miles in length); and 3) the Aberdeen-Wilson project (approximately 26.8 miles in length). Each of these proposed transmission line projects would include a combination of relocation/rebuild of existing transmission lines on existing ROW with construction of new transmission lines along new ROW. None of these proposed projects has been completed, but the effects of each project are expected to be generally comparable to the effects of the GM-Memphis Junction Transmission Line as described in this report.

Other existing and planned actions in the general proposed project vicinity include the Kentucky Transpark, a proposed 1,200-acre commercial and industrial park just north of Bowling Green. Currently, the Bowling Green Metalforming (Magna) facility is the only major tenant in the Transpark, but additional commercial and industrial development is anticipated over the next decade. Other ongoing commercial and industrial development in the area includes the Scotty's Industrial Park, and various other residential, educational, and commercial developments have occurred or are planned, in the general vicinity. Finally, the Kentucky Transportation Cabinet is evaluating the possible construction of a new highway connector between Interstate 65 and U.S. 31W in the general vicinity of the General Motors

and Magna manufacturing facilities to serve increased traffic demand associated with the ongoing commercial and industrial growth.

8.0 ENVIRONMENTAL CONSEQUENCES

8.1 AIR QUALITY

Exhaust from the engines of the machinery used to construct the proposed electric transmission line may increase emissions in the proposed project area on a short-term basis. However, the components of exhaust are volatile and would probably move out of the immediate project area within a short period of time. Additionally, it is doubtful that the exhaust from such machinery would significantly contribute to the overall concentrations of ozone, nitrogen oxides, aldehydes or other noxious substances.

The dust associated with the proposed construction activity could have a small potential for affecting the air quality of the immediate project impact area. This source of air quality degradation, however, would not be anticipated to have any significant effect on the area. Any dust associated with construction activities would be short-term, lasting only through the construction phase of the project. Additionally, vegetation would be cut from the proposed ROW and the areas denuded of vegetation would be very small. As a result, the amount of air quality degradation associated with fugitive dust would be negligible and once construction is completed there would be a return to ambient air quality conditions in the immediate vicinity of the project impact area. No dust would be associated with the maintenance of the proposed project once the construction activities are completed. The ROW would be maintained by a foliar method of herbicide application possibly combined with some vegetation cutting, which would not produce any dust.

The herbicides proposed for use would not have any affect on the air quality of the project area. The applicators would be trained and licensed for the application of herbicides, and herbicide label directions would be strictly followed. Herbicide applications would also be made in accordance with the requirements of the Kentucky Division of Pesticides, and applicators would monitor weather conditions and would postpone or suspend applications when conditions become unfavorable as outlined below:

Application Method	Temperatures Higher Than (°F)	Humidity Less Than (%)	Wind (at Target) Greater Than (MPH)
Hand (cut surface)	n/a	n/a	n/a
Hand (other)	98	20	15
Mechanical (ground)	95	30	10
Aerial	95	30	5

The proposed electric transmission project would not be expected to have any significant cumulative effects on air quality. As outlined above, the direct and indirect air quality impacts of the proposed would be expected to be minimal, and mitigation measures incorporated in the proposed action would further reduce any potential air quality effects. Thus, the proposed action would not be expected to contribute to any significant incremental effects on air quality in light of other actions occurring in the project vicinity.

8.2 WATER QUALITY

The proposed construction activity associated with the proposed electric transmission project would not have any direct effects on rivers and streams. The proposed transmission line would span all of the watercourses involved, with no support poles placed within the channels, and none of the construction equipment or vehicles would be permitted to ford the Barren River or any of the creeks or streams in the project area.

The proposed project could have a small potential for water quality degradation of the river and streams due to the erosion of soils in association with water runoff on the

construction sites. The mechanical cutting methods of ROW clearing associated with the proposed project could also potentially increase nutrients, storm flows, and sediment loads of the streams within the project area. Generally, the amount of increase depends on the degree of disturbance, the topography of the area, and the type of soil involved. The manual cutting methods of the transmission line construction would not substantially increase storm flow volumes and peaks because plant water use would be minimally affected. The manual methods would not increase nutrients or sediment loads of the streams in the project area because litter and duff would be left intact.

To aid in protecting the water resources of the project area from sedimentation, EKPC would be employing accepted erosion control practices, which would incorporate *Best Management Practices* (BMPs) to prevent nonpoint source pollution and control stormwater runoff and sediment damage to water quality. These erosion control practices would include the utilization of silt barriers, such as siltation fences and/or straw bales around any disturbed areas in the vicinity of the streams to filter runoff water. To aid in protecting the water quality of the project area, EKPC also would not initiate required land-clearing activities until absolutely necessary to reduce the amount of time bare soils are exposed to wind and water erosion. Additionally, areas of soil disturbed by the proposed construction activity would be temporary, lasting only through the construction stage of the project, and all disturbed areas would be stabilized and revegetated, as soon as practicable, once construction is completed. The proposed project could further cause water quality degradation if vegetation cut from the proposed ROW during the construction phase of the project falls into the river or stream channels. To mitigate this potential form of degradation, any vegetation falling into watercourses during construction would be removed and pulled back from the channels.

The proposed project could have a potential of affecting water quality within the project area from the herbicides used on the proposed ROW entering surface water during maintenance operations associated with the proposed transmission line ROW. However, herbicide applications would be made in accordance with label directions and the Kentucky Division of Pesticides to guard against the contamination of water resources within the proposed project area. Herbicides could enter rivers and creeks during treatment by direct application or drift, or within water runoff after treatment. The risk of herbicides entering surface water by direct application would be low because applicators would monitor weather conditions to aid in protecting water quality and would postpone or suspend application operations when weather conditions become unfavorable as outlined in Section 8.1 *AIR QUALITY*. Applicators would also postpone herbicide applications during occurrences of precipitation or when precipitation is predicted to protect against herbicides affecting water resources of the area through rainwater runoff. EKPC's policy prohibits herbicide applications during periods of rain or when the threat of rainfall is imminent.

In addition to surface water, groundwater could be affected by herbicide applications through the vertical seepage of herbicides into aquifers. However, the use of vegetation buffer strips is recognized as an effective mechanism to aid in guarding against herbicides within rainwater runoff from affecting water quality. Consequently, EKPC would utilize the following buffer strips, or zones, to further aid in protecting the quality of the water resources within the proposed project area:

- no herbicide would be applied within 30 horizontal feet of lakes, ponds, wetlands, perennial or intermittent springs, seeps, or streams;
- no herbicide would be applied within 100 horizontal feet of any public or domestic water source; and
- herbicide mixing, loading, or cleaning areas would not be located within 200 feet of any open water, or public or domestic water source.

Through the implementation of these mitigation requirements the risk to water contamination would be minimal because the buffers would reduce herbicide concentrations through mixing and dilution.

Significant cumulative effects on the water resources of the area caused by the proposed electric transmission project would not be expected given the mitigation measures that would be implemented. The sediment load of the surface water caused by the proposed project would be negligible to nonexistent, given the mitigation measures described above, and the herbicides would not leach into the groundwater or run off into surrounding surface waters in significant amounts. Additionally, the proposed use of herbicides to aid in managing vegetation within the ROW for the proposed electric transmission line would involve infrequent herbicide applications in relatively small quantities, and as a result of the incorporation of the above-described mitigation measures, the use of herbicides to maintain the proposed electric line ROW would not have any significant incremental effects on the water resources of the project area.

8.3 WETLANDS

As described in Section 7.0 *EXISTING ENVIRONMENT*, the proposed route for the electric transmission line traverses wetland areas associated with the Barren River and Jennings Creek, as well as a couple of very small isolated wetlands. There are no practicable alternatives to crossing these wetland areas should the proposed transmission line be constructed. The wetlands areas associated with the Barren River and Jennings Creek that would be traversed, and the isolated wetland on the eastern portion of the proposed route, would either be crossed on existing electric utility line ROW or parallel to existing ROW. Moving the alignment of the proposed new transmission line off the existing ROW would

have more of an effect on the existing land use in the project area and would add to construction costs, as compared to the proposed alignment, due to the new ROW that would be required. Moving the proposed alignment off, or away from, the existing ROWs would also have more of an effect on the existing land use in the project area due to the further transection of parcels of land in the area. In addition, there are no practicable alternatives to crossing the small isolated wetland along the western portion of the proposed alignment because of existing development and other small isolated wetlands in the area. However, the proposed transmission line would not have any direct effects on the wetland areas in question because the transmission line would be able to span the wetlands and would not result in the placement of support structures in these areas. The proposed transmission line would also not have any indirect effects on the wetlands because EKPC would be implementing *Best Management Practices* to protect the wetlands from sedimentation combined with other mitigation measures to prevent the herbicides from leaching into the wetlands (See Section 8.2 *WATER QUALITY*). Additionally, no construction equipment or vehicles would be permitted within the wetland areas.

Significant cumulative effects on the identified wetland areas caused by the proposed electric transmission line project would not be expected. Sediment load of the wetlands, if any, would be negligible given the mitigation measures that would be implemented, and the herbicides would not be expected to combine with rainwater run off in significant amounts and reach the wetland areas.

8.4 FLOODPLAINS

The proposed route for the planned new electric transmission line traverses floodplain areas associated with the Barren River and Jennings Creek (See Section 7.0 *EXISTING*

ENVIRONMENT). There are no practicable alternatives to crossing these floodplains should the proposed transmission line be constructed because the floodplain areas in question would be crossed on either existing electric utility line ROWs or adjacent to such ROWs. Moving the alignment of the proposed new transmission line off the existing ROW in an attempt to avoid the floodplain areas would add to construction costs and would have more of an effect on the existing land use in the project area, as compared to the proposed alignment, due to the new ROW that would be required. Moving the proposed transmission line alignment off, or away from, the existing ROW would also have more of an effect on the existing land use in the project area due to the further transection of parcels of land in the area. Due to the width of the floodplain areas identified and the alignment of the proposed route in relation to the floodplain areas, the placement of support structures within these floodplains would be unavoidable (See Floodplain Crossings Map, page 33). The proposed support structures, however, would be pole type structures that would have very little, if any, effect on flood flows or levels. Consequently, cumulative effects from the placement of the proposed electric transmission line within the floodplain areas would not be expected.

8.5 SOILS

During the construction of the proposed electric transmission line the soils within the proposed ROW could be affected by vehicles being driven on the ROW causing compaction and erosion of soils. The weight of the vehicles and associated machinery on the ground causes compaction of the soil. Soil compaction increases bulk density and decreases aeration porosity. This affects the soil's ability to store and supply air, water and nutrients. Soil compaction on the proposed ROW would be minimal. To aid in mitigating soil compaction off-road travel of construction vehicles would be kept to a minimum. However, areas

affected by construction access roads and areas of sustained gentle slopes along the proposed ROW would experience soil compaction due to the use of construction equipment.

The construction of the proposed new transmission line is not expected to have any significant effect on the soils of the project area. The majority of the proposed project would entail the rebuilding of an existing electric utility line with adequate electrical clearances between the vegetation and the existing electrical conductors. Consequently, minimal tree and vegetation removal would be required along this section of the proposed route to maintain electrical clearances. Along the new sections of the proposed transmission line, vegetation within the ROW would be cut to achieve electrical clearances, leaving roots intact to aid in holding soils in place. Soils would be exposed to wind and water erosion at support structure locations within the proposed ROW to allow for the installation of the support structures, which represents a very small amount of the land within the transmission line ROW. Soils would also be exposed at construction access road locations along the proposed ROW.

As outlined in Section 8.2 *WATER QUALITY*, EKPC would be implementing soil erosion practices during the construction phase of the project to guard against soils from leaving the construction sites, and disturbed areas would be stabilized and revegetated, as soon as practicable, once construction activities are completed. Soil erosion on the proposed transmission line ROW during maintenance cycles would not be a problem because mechanical equipment may not be used to perform maintenance procedures, and if such equipment is used it normally only involves one or two passes to perform maintenance procedures, which would not create an erosion problem.

As outlined above, no major erosion problems would be anticipated from the construction and maintenance of the proposed project; therefore, the proposed electric

transmission project would not have any significant cumulative effects to the soils located on the proposed ROW.

8.5.1 Prime and Important Farmland Soils

The proposed route for the planned new electric transmission line traverses soils that are recognized as prime and statewide important farmland soils (See Section 7.0 *EXISTING ENVIRONMENT*). There would be no practicable alternatives to traversing prime and important farmland soils in the project area should the electric transmission line be constructed because these types of soils are scattered throughout the area and would be unavoidable by the electric transmission line route. The effect of constructing the proposed transmission line on the prime and important farmland soils would be minimal. The majority of the proposed route for the new line would involve the rebuilding of an existing electric utility line on existing ROWs that, according to the U.S. Natural Resource Conservation Service (NRCS), “*would not affect prime or important farmland*” (See NRCS letter from Mr. Don McCallon to Mr. Gary W. Gilpin, GILPIN GROUP, September 13, 2005, and GILPIN GROUP letter from Mr. Gary W. Gilpin to Mr. Donald McCallon, NRCS, May 17, 2006, Appendix C). Additionally, EKPC has a policy of allowing agricultural practices within its ROWs as long as they do not interfere with, or jeopardize, the operation of its lines. Therefore, farmland soils would only be permanently lost to agricultural practices in the immediate vicinity of the transmission line support pole locations within the proposed ROW, which represents a very small amount of the total ROW. As a result, the proposed electric transmission project would not be expected to have any significant cumulative effect on prime or statewide important farmland soils located in the project area.

8.6 LAND USE & RECREATION

The proposed electric transmission line would not be expected to have any significant effect on the existing land use in the project area. The majority of the proposed line would involve the rebuild of existing electric utility lines on existing ROWs and the existing land use along these sections of the proposed transmission line route would remain unchanged. The land use along the agricultural portions of the proposed new line sections would also essentially remain unchanged because EKPC has a policy of allowing agricultural practices within its ROWs, as long as such practices do not interfere with, or jeopardize the operation of its lines. The majority of the proposed route extends through rural areas and was routed in negotiations with the landowners involved and in an attempt to avoid concentrated residential development. Some of the proposed rebuild portions of the route pass within close proximity to residential development in the vicinity of Bowling Green; however, the land use within these portions of the proposed route would remain unchanged and no significant effect on the residential development would be expected. As a result, the proposed transmission route would have minimal impacts on existing residential development in the project area.

Approximately 17 percent of the proposed route for the transmission line, or roughly 31.3 acres, would require clearing, approximately 25.5 acres of which is composed of wooded areas and would result in a change in the existing land use. However, this amount of clearing is relatively small in relation to the total project and would not constitute a significant change in land use given the large amount of wooded areas in the region. In addition, approximately 2.41 miles of the proposed route parallels an existing electric transmission line, which would aid in mitigating potential effects that the proposed new line would have on the existing land use within this area.

As described in Section 7.0 *EXISTING ENVIRONMENT*, no developed recreational facilities, such as, campgrounds or picnic areas, exist within the project impact area and, as a result, these types of areas would not be affected by the proposed electric transmission project. Incidental hiking, and deer and small game hunting activities could occur within the project area and could be affected by the proposed project. However, such activities would take place on a case-by-case basis and any effect to these types of activities by the proposed project would be minimal, if at all.

As described above, the proposed electric transmission line project would have minimal effects on the existing land use and incidental recreational activities that may occur within the project area. As a result, no significant cumulative impacts would be expected by the proposed project.

8.7 VEGETATION

The proposed electric transmission line project would involve the cutting of trees along the proposed electric transmission line ROW to provide adequate electrical clearances for the proposed transmission line. Within the proposed ROW there are approximately 31.3 acres of land that would require clearing to achieve electric clearances for the proposed transmission line. Vegetation along the proposed ROW in the immediate vicinity of the transmission line support structures would be removed to allow for placement of the support structures. This would involve a very small amount of land of less than 0.005 acre at each structure location.

The herbicides being proposed to manage vegetation during the maintenance of the transmission line ROW would by design kill or injure any plants coming into contact with the chemicals. EKPC is proposing the use of herbicides to control targeted woody-stemmed

vegetation on the proposed ROW, but non-target plants could be injured by herbicide drip, over spray, drift or accidental discharge. Herbicide drift should not be an issue, however, because such drift can be minimized and managed through proper application techniques under proper environmental conditions. As part of the proposal, applicators would be appropriately trained on the effects of wind and other environmental conditions on off-site herbicide movement. Weather would be monitored and herbicide applications would be suspended if temperature, humidity or wind speeds become unfavorable (See Section 8.1 *AIR QUALITY*).

The introduction of herbicide applications, as described in the proposal, would result in vegetation on the ROW becoming comprised mostly of low growing plant species including shrubs, ferns, grasses, forbs and low growing tree species, such as dogwoods. The majority of the taller growing tree species would be eliminated over time by the herbicide applications. The utilization of herbicides would also result in an increase in the diversity of the vegetation within the ROW. Through the use of herbicides, woody-stemmed species within the ROW would be reduced or eliminated, and competition for low growing species would be reduced. Many of these low growing species require open areas to thrive and with the absence of tree cover, low growing plant communities can better become established. In some instances, under the right conditions, seeds that may be present on the ROW and have a long period of viability will germinate.

The proposed transmission line ROW would not change the overall land use, forest types or stand conditions within the wooded portions of the project area and, as a result, fragmentation of the forested lands within the area would not be a concern. Forest fragmentation occurs when the land use of a block of forested land is changed in such a

manner that one section of the forest becomes isolated from the other, i.e., establishment of a strip coalmine or construction of a shopping center. The proposed ROW would resemble an area that has been naturally disturbed by a strong straight-line wind and would not result in isolating sections of the forest. Vegetation in the proposed ROW would ultimately consist of shrubs, grasses and forbs, which would not present a barrier to wildlife species, and wildlife could traverse or move about within the ROW.

The cumulative effect on the vegetation of the project area by creating the proposed ROW and maintaining it with herbicides would be a reduction of tall growing plant species and an increase in shrub, forb and herbaceous species. The indirect cumulative effect would be the establishment of a relatively stable low growing plant community requiring minimal treatment in the future. The proposed ROW would promote a more stable, lower growing plant community, resulting in increased diversity of wildlife habitat and decreased intensity of management in the future.

8.8 WILDLIFE

Different wildlife species require different habitats composed of unique arrangements of food, water and cover to survive. As changes in habitats occur, the variety and abundance of wildlife species change, as well. The cutting of the vegetation from the proposed transmission line ROW as described in the proposed project may change the movement of wildlife through the ROW in wooded areas due to the cut vegetation. The proposed ROW would produce a linear opening in wooded areas where wildlife habitat would be changed from forested land to early successional type habitat. Bird species favoring this type of successional habitat, such as the eastern towhee, northern cardinal, song sparrow, eastern bluebird, white-eyed vireo, northern bobwhite quail and the prairie warbler would benefit by

the proposed transmission line ROW. The proposed ROW would also provide habitat for a number of small mammal species and birds of prey. Wildlife species favoring forested type habitats, such as wood thrush, red-eyed vireo, eastern wood pewee and the ovenbird would not benefit from the proposed ROW. Due to the large amounts of forested areas in the region in relation to the relatively small amount that would be affected by the proposed electric transmission project, the wildlife species favoring the forested type habitat should not be significantly affected.

Construction of the proposed ROW would result in the development of edge habitat. Edge habitat may occur when two plant communities meet. The edge habitat established by the proposed ROW would generally be between a forested and a grass/forb plant community. Shrubs and young trees would grow to form the edge, or transition zone from grass/forb to forestland. The proposed ROW is 100 feet wide. The width of the edge would eventually be approximately 10 feet along either side of the ROW. The width of the ROW would probably provide nesting habitat for bird species, such as, the white-eyed vireo, yellow-breasted chat, northern cardinal, wild turkey and song sparrow.

The cutting blades of the mechanical equipment used to clear the proposed ROW could injure or kill individual wildlife species caught by the equipment, such as small mammalian, amphibian and reptile species, and nesting birds. The noise produced by the cutting machinery may have short-term impacts to wildlife species in and around the ROW by causing these species to avoid the immediate area. The exhaust from the engines of the machinery could result in the movement of wildlife out of the treatment area on a short-term basis. However, the components of exhaust are volatile and would probably move out of the immediate project area within a short period of time.

The proposed transmission project could potentially affect fish and other aquatic species living in, and downstream from, the project area should a large amount of sediment be eroded from the construction sites and be introduced to the surface water system and transported downstream. However, the proposed project is designed to prevent this from happening by reducing the potential of erosion runoff. As described in Section 8.2 *WATER QUALITY*, EKPC would be implementing *Best Management Practices* (BMPs), as well as other erosion protection measures, to prevent non-point source pollution and sediment damage to water quality. As a result, fish populations living in, or downstream from, the proposed project area should not be affected as a result of implementing the proposed project.

The proposed use of herbicides by EKPC to manage vegetation within the proposed transmission line ROW would not be expected to have any adverse effects on the wildlife, fish or other terrestrial or aquatic species living in and around the proposed project area. The herbicides that would be used on the ROW would be approved by EPA and would be strictly applied according to label directions by licensed applicators.

No significant cumulative effects to the wildlife of the project area would occur should the proposed electric transmission project be approved and constructed. As outlined above, the proposed project would not be expected to have any adverse effects on terrestrial and aquatic wildlife species, and some species would benefit from the proposed new ROW.

8.9 THREATENED, ENDANGERED OR RARE SPECIES

EKPC conducted a biological survey, including a mist netting survey, on the proposed electric transmission project impact area, the purpose of which was to determine the possible presence/absence of any rare, threatened, or endangered species in the area. (NOTE: Eggert's sunflower (*Helianthus eggertii*) was included in the survey but this plant has subsequently

been removed from the endangered species list.) The surveys did not uncover the presence of any of these species with the exception of six federally endangered gray bats (*Myotis grisescens*) that were captured during the mist netting surveys. The project corridor was subsequently surveyed for the presence of caves and sinkholes that could serve as roosting habitat for the gray bat and none were found (See EKPC letter from Mr. Joe Settles to Mr. Lee Andrews, U.S. Fish and Wildlife Service, September 2, 2005, and EKPC letter from Mr. Joe Settles to Mr. Lee Andrews, U.S. Fish and Wildlife Service, May 9, 2006, Appendix C, as well as, the MIST NETTING SURVEY REPORT, Appendix E). As a result of the surveys conducted, EKPC determined that the proposed electric transmission line project would not adversely affect threatened or endangered species. EKPC sent the results of the surveys to the U.S. Fish and Wildlife Service for review and the U.S. Fish and Wildlife Service (USFWS) concurred with EKPC's determination (See USFWS letter from Mr. Virgil Lee Andrews, Jr. to Mr. Joe Settles, EKPC, October 5, 2005, Appendix C).

The Kentucky Department of Fish & Wildlife Resources (KDFWR) was contacted regarding the proposed project in relation to threatened and endangered species. The KDFWR responded that it was concerned regarding possible effects on the Indiana bat (*Myotis sodalis*), as well as a several federal and state listed mussels (See KDFWR letter from Mr. Doug Dawson to Mr. Gary W. Gilpin, GILPIN GROUP, September 26, 2005, and GILPIN GROUP letter from Mr. Gary W. Gilpin to Mr. Doug Dawson, April 26, 2006, Appendix C). However, during the mist netting surveys no Indiana bats were captured, indicating the absence of this species in the project area. Therefore, the proposed transmission line project would not have any adverse effects on the Indiana bat (See MIST NETTING SURVEY REPORT, Appendix E). Additionally, due to the erosion and

sedimentation control measures that would be implemented for the proposed project (See Section 7.2 *WATER QUALITY*), the construction and operation of the proposed electric transmission line would not have adverse effects on the concerned mussels.

Since the proposed transmission project would not have any adverse effects on threatened or endangered species, cumulative effects on such species by the proposed project would not be expected to occur.

8.10 CULTURAL RESOURCES

During consultation with EKPC regarding the proposed electric transmission project, the Kentucky Heritage Council, State Historic Preservation Office (SHPO) determined that the portion of the proposed project that would involve the rebuilding of the existing electric utility line on existing ROW, and the section of the proposed project that would be located immediately adjacent, and parallel, to existing electric utility line ROWs, would not have an effect on cultural resources. However, the SHPO identified five previously surveyed sites that are located in the project area and, as described in Section 7.0 *EXISTING ENVIRONMENT*, requested a cultural historic reconnaissance survey of the project area and a reevaluation of the five previously identified sites (See EKPC letter from Mr. Joe Settles to Mr. David Morgan, Kentucky Heritage Council, December 7, 2005, and SHPO letter from Mr. David L. Morgan to Mr. Gary W. Gilpin, GILPIN GROUP, April 19, 2006, Appendix C), which EKPC had performed. Based on information supplied by the SHPO, along with the survey results, the survey report determined there are no known historic properties or sites that are listed or proposed for listing in the National Register of Historic Places located in the project impact area. The survey report also determined that there is one known historic site (aboveground resource) in the project area that appears to be eligible for listing, the Gladdish-

Asher property located on the southern side of U.S. Highway 68; and one industrial archaeological resource potentially eligible for listing comprised of a large quarry located on the Perkins' property on the northern side of U.S. Highway 68. Based on the results of the survey, a determination of *no adverse effect* was made pertaining to the Gladdish-Asher property due to the existing visual intrusion within the property's viewshed. Additionally, the proposed transmission line within the current viewshed of the Gladdish-Asher property would not adversely affect those qualities for which the dwelling achieves architectural significance (See Cultural Resource Survey & Determination of Effect, Appendix F, for more detailed information). Regarding the large quarry located on the Perkins' property, the proposed transmission line route does not traverse the quarry area and, therefore, this proposed project would not have any effect on this archaeological resource.

In addition to the above described survey, EKPC placed newspaper advertisements in the February 27 & 28, 2006 edition of the *Bowling Green Daily News*, in accordance with 36 CFR Part 800 of the *National Historic Preservation Act*, as amended, soliciting consulting parties who have a demonstrable interest in important historic and archaeological resources in the project impact area. No respondents replied to EKPC as a result of the newspaper advertisement. EKPC also contacted by letter nine Native American Indian tribes who could potentially have an interest in the proposed project (See EKPC letters from Mr. Joe Settles to various Native American Indian tribes, March 1, 2006, Appendix C). Of the nine tribes contacted, two written responses were received. One expressed no interest in the proposed project (See Miami Tribe of Oklahoma letter from Ms. Julie L. Olds to Mr. Joe Settles, EKPC, March 7, 2006, Appendix C), and the other requested that it be notified should any items falling under the *Native American Graves Protection and Repatriation Act* be

discovered during construction activities (See Peoria Tribe Of Indians Of Oklahoma letter from Mr. John P. Froman to Mr. Joe Settles, EKPC, March 8, 2006, Appendix C). EKPC is committed to complying with this request. EKPC also sent letters to the Warren County Judge Executive and the Mayor of Bowling Green, informing them of the proposed project and requesting that they contact an EKPC representative should they desire to participate in the Section 106 review process as a consulting party. Ms. Walker, Mayor of Bowling Green, designated via email that Ms. Robin Zeigler, Historic Preservation Officer for Bowling Green is the appropriate contact for this project. Ms. Zeigler is considered a consulting party for the project.

No significant cumulative effects to cultural resources would be expected should the proposed electric transmission project be approved and constructed because, as outlined above, the majority of the proposed project would not have an effect on important cultural resources. Based on the survey results, the proposed project also would not have any adverse effect on the Gladdish-Asher property, and would not have any effect on the quarry located on the Perkins' property.

NOTE: For the purposes of project review, the consultation process under the Section 106 of the *Historic Preservation Act* and the NEPA review process have been combined and will proceed concurrently for this proposed project.

8.11 TRANSPORTATION

The construction of the proposed electric transmission project would not have any significant effect on transportation taking place within the proposed project area.

The construction of the proposed electric transmission line could minimally increase traffic within the project area through the movement of construction vehicles along the

proposed route. However, this increase in traffic would be temporary and there would be a return to normal conditions upon completion of construction activities. Maintenance of the proposed transmission line would not be expected to have any impact on traffic flows or patterns within the project area.

The construction of the proposed transmission line could also have a temporary effect on transportation in the project area through temporary road closures. During the construction of the proposed line, the electrical conductors would be strung on the support structures using a pulley system and helicopter, or with a tensioner mounted on the back of a digger/derrick truck. At the proposed transmission line crossings some of the roads may have to be temporarily closed for safety purposes during the stringing of the electrical conductor onto the support structures. These road closures could range in duration from the halting of traffic for minutes to temporary closing the road for up to four hours based on the width of the road and the complexity of the crossing. These temporary road closings would not be expected to have any significant impacts on transportation in the area because once the aerial crossing is completed the road would be reopened, and traffic flows and patterns would return to normal. EKPC would coordinate the proposed transmission line construction with the Kentucky Transportation Cabinet and would secure all the required permits for the road and highway crossings prior to construction.

The Barren River is recognized by the U.S. Army Corps of Engineers as being navigable in the proposed project area; however, the crossing of this river by the proposed transmission line is not expected to have any significant impact on river transportation. Should any river traffic need to be halted during construction, it would most likely only involve small pleasure craft, if any. Additionally, the halting of river traffic would be

temporary and would resume once the stringing of the conductor over the river crossing is completed. EKPC would also secure the necessary river crossing permits from the U.S. Army Corps of Engineers for the crossing of navigable waters under the authority of the *Rivers and Harbors Act of 1899*.

As described above, the proposed project would have only minimal temporary effects on transportation within the project area and, as result, would not have any cumulative effects on transportation.

8.12 NOISE

Noise from the proposed construction activity associated with the proposed project would have a very minor impact on noise levels in the immediate project impact area. Noise would emanate from chainsaws and machinery used during ROW clearing activities, and from vehicles, machinery and equipment used during the physical construction of the proposed project. However, this increase in noise levels would be short-term and there would be an immediate return to ambient noise levels upon completion of construction activities. Since the proposed project would have only short-term minor impact on the noise levels within the project area, no cumulative impacts on noise levels would occur.

8.13 HEALTH & SAFETY

The clearing of vegetation associated with the proposed electric transmission line could have an effect on the health and safety of construction crewmembers, as well as the public in general. One common tool used for manually cutting and clearing vegetation in the electric utility industry is the chainsaw. The chainsaw can be one of the most dangerous hand cutting tools used by ROW management crews and cuts caused by these tools can be encountered by crewmembers. Other hazards associated with chainsaw use include flying

wood chips, sawdust and bar oil causing eye problems for workers. Another hazard associated with chain saw use could be hearing loss if proper ear protection is not used. However, if the chainsaws are operated in a safe manner adhering to EKPC's safety rules with protective clothing, eye ware, and ear protection, injuries from chainsaws should not present a problem.

Mechanical types of equipment used during construction activities, such as bulldozers, could also pose a hazard to construction workers. This type of equipment could rollover when operated improperly on steep grades injuring the operator and any nearby crewmembers who happen to be in the way. Fire can also potentially be a hazard to ROW crewmembers attempting to refuel hot engines or when leaked oil or flammable debris comes into contact with hot engines.

Emissions from the exhaust of chainsaws and mechanical equipment could result in exposing operators to a number of carcinogens known to be present in the exhaust of internal combustion engines, such as benzene, 1,3-butadiene and numerous polyaromatic hydrocarbons. Exhaust from the engines also expose equipment operators to carbon monoxide and neurotoxic hydrocarbons, as well as irritants, such as, formaldehyde, acrolein and nitrogen oxides. However, the components of exhaust are volatile and would probably move out of the immediate project area within a short period of time.

Hazards to the general public could occur during vegetation clearing activities if individuals were to enter work areas while machinery is operating and the vegetation is being cut. Individuals of the public present on or near the work sites when the cutting operations are occurring could be struck by falling vegetation, flying wood chips, sawdust, etc. Stubble left on the ROW after cutting operations are completed can also present a hazard to the public

by individuals tripping over or falling onto cut stumps and stubble causing injury. Since no formal recreational activities take place within the project area (See Section 8.6 *LAND USE AND RECREATION*) and the majority of the transmission line route is located in rural areas, the risk to the general public from ROW clearing cutting operations would be negligible. This risk would not be present during the maintenance of the proposed ROW because only minimal, if any, cutting of vegetation on the ROW would be required during each maintenance cycle.

The proposed use of herbicides for the management of vegetation within the proposed ROW would involve the utilization of herbicides approved for such use by the U.S. Environmental Protection Agency. Such chemicals would also be applied according to strict label directions by licensed applicators. Therefore, the proposed use of herbicides would not be expected to pose any significant risk to workers or the general public.

The proposed transmission project would not have any cumulative effects on the health and safety of the general public and construction crew workers because the risk to such individuals as a result of constructing the proposed project would be minimal.

8.14 RADIO, TELEVISION & CELLULAR PHONE INTERFERENCE

The proposed electric transmission line should not have any effect on radio or television reception because electric transmission line equipment by design does not cause radio or television reception interference. However, faulty insulators or loose hardware on a transmission line can cause such interference. Should EKPC receive a reception interference complaint it has a policy of investigating the source of the interference and taking steps to remedy the situation, such as replacing insulators, tightening hardware, etc., should the source of the problem be determined to be electric equipment associated with one of its electric

facilities. Additionally, the proposed electric transmission line would not be expected to cause radio or television reception interference because the majority of the proposed route extends through rural areas and the distance of the occupied structures from the proposed transmission line ROW.

Mobile and automobile radios could lose signal strength directly underneath the proposed electric transmission line, such as a loss of signal strength when traveling underneath the transmission line at a road or highway crossing. Cellular telephones could also lose signal strength directly underneath electric transmission line when located in a fringe area of the cellular service companies. However, these would be temporary, or momentary, losses of signal strength that would not significantly affect the use of mobile or automobile radio, or cellular telephone equipment. Therefore, no cumulative effects are expected as a result of the proposed action

8.15 SOCIOECONOMICS & ENVIRONMENTAL JUSTICE

The proposed new electric transmission line project would not have any effect on the population or the economy of the area. The proposed new line also would not create new jobs or affect the unemployment rate for the area involved. Additionally, the proposed route for the transmission line is not disproportionately located through minority or low-income areas and, as a result, the proposed transmission line would not have any disproportionate effects on populations located in such areas. The proposed project also would not have any impact on, or be influenced by, the civil rights, ethnic origin, sex or social status of people living within the proposed project area.

8.16 AESTHETICS

The construction of the proposed electric transmission line would not have significant impacts on the aesthetics of the project area. The proposed new line would not be visible from any recreational areas since none of these types of areas exist within the project area (See Section 7.0 *EXISTING ENVIRONMENT*). The proposed new transmission line would also be supported by Corten tubular steel structures that would give the appearance of redwood and which would aid in blending the proposed line into the surrounding background. In addition, the majority of the proposed new line would be located on an existing electric transmission line ROW and would involve rebuilding and replacement of the existing electric transmission line. As a result, the proposed new line would be very similar in appearance to the existing line and would not result in any significant additional aesthetic impact within these areas. A 2.42 mile section of the proposed new transmission line would also parallel existing electric transmission lines and the potential aesthetic impact of the proposed new line within this section would be somewhat mitigated by the aesthetic impact which the existing lines currently have on the area. Additionally, the proposed new line section located on the western end of the route extending in a north-south orientation, and not located on existing ROW or paralleling existing transmission lines, is located in a rural area. This new line section is not located in the vicinity of any concentrated residential development and would not be readily visible from such development. The proposed new line on the western end of the route would be visible from various road crossings, but due to the topography and vegetation in the area the line would only be visible for short distances and the Corten steel structures would aid in blending the line into the surrounding landscape.

As described above, the majority of the proposed electric transmission line route would involve rebuilding existing electric lines, and due to the materials that would be used coupled with the vegetation and terrain in the project area, the proposed project would have minimal effects on the aesthetics of the area. As a result the proposed project would not be expected to have any significant cumulative impacts on the project area.

9.0 MITIGATION

As described in the previous section *8.0 ENVIRONMENTAL CONSEQUENCES*, EKPC would be implementing numerous mitigation measures to aid in minimizing potential environmental impacts that could be caused during the construction and operation of the proposed electric transmission project. The following is a summary of the mitigation measures that EKPC would implement:

- EKPC would incorporate *Best Management Practices* that would employ accepted erosion control practices to aid in preventing non-point source pollution and control stormwater runoff and sedimentation. Such practices would include, but not be limited to, the utilization of silt barriers, the cutting of vegetation requiring removal from the proposed ROW to leave roots intact and minimize soil disturbance, not initiating any land-clearing activities until absolutely necessary to reduce the amount of time bare soils are exposed, removing any vegetation falling into watercourses, and all disturbed areas would be stabilized and revegetated, as soon as practicable, once construction is completed.
- No transmission line support poles would be placed within streams or river channels, and no construction equipment or vehicles would be permitted to ford such watercourses, or within wetland areas.
- Vegetation removed from the proposed ROW would be cut from the ROW, leaving roots intact to aid in holding soils in place and control erosion.
- Any cut vegetation falling into river or stream channels would be removed and pulled back from the channels to aid in protecting water quality.

- Herbicides would be applied by trained and licensed applicators, and would be made in accordance with strict label directions and the requirements of the Kentucky Division of Pesticides, using EPA approved herbicides.
- Applicators would monitor weather conditions and would postpone or suspend applications when conditions become unfavorable, as outlined in Section 8.1 *AIR QUALITY*.
- No herbicide would be applied within 30 horizontal feet of lakes, ponds, wetlands, perennial or intermittent springs, seeps, or streams.
- No herbicide would be applied within 100 horizontal feet of any public or domestic water source.
- Herbicide mixing, loading, or cleaning areas would not be located within 200 feet of any open water, or public or domestic water source.
- Herbicide applications would not be prohibited during periods of rain or when the threat of rainfall is imminent.

10.0 CONCLUSION

The environmental investigation undertaken for EKPC's proposed GM to Memphis Junction Electric Transmission Line, and documented in this report, did not uncover any significant environmental impacts that would result from the construction of the proposed project. EKPC is also aware of the environmental commitments expressed in this document and is dedicated to following these commitments during the construction and operation of the proposed facility. Therefore, the construction of EKPC's proposed new electric transmission line would not have any significant effects on the quality of the natural or human environment in the project area.